REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-5 and 8, 9, 11-15 are pending, with Claims 6-7 and 10 cancelled, Claims 1-5, 9 and 11 amended, and Claims 12-15 added by the present amendment.

In the Official Action, Claims 10-11 were rejected under 35 U.S.C. §101; and Claims 1-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nagaya et al. (U.S. Patent Publication No. 2002/0030739, hereinafter Nagaya) in view of Rui et al. (U.S. Patent 6,999,599, hereinafter Rui).

Claims 1-5, 9 and 11 are amended to more clearly describe and distinctly claim Applicant's invention. Support for this amendment is found in Applicant's originally filed specification. New Claims 12-15 recite features similar to those recited in amended Claims 2-5. Claim 10 is canceled and Claim 11 is amended to comply with 35 U.S.C. §101. No new matter is added.

Figure 5D is amended to correct a graphical error and to comply with Applicant's specification. The specification is amended to correct an inconsistency. Figures 19, 20, 24, 26, 28 and 29 are labeled as "BACKGROUND ART". Step S4 of Figure 4 is amended to more clearly correspond to Applicant's disclosed invention. No new matter is added.

Briefly recapitulating, amended Claim 9 is directed to an image processing method for extracting an object in an image. The method includes, *inter alia*, a) detecting a first frame containing a first frame covered background area and detecting a last frame containing a last frame uncovered background area; b) prompting a user to input a first frame contour of a first subset of the object to be extracted within the first frame covered background area and to input a last frame contour of a second subset of the object to be extracted within the last frame uncovered background area, respectively; and c) extracting the object from a plurality

of frames from the first frame to the last frame based on the respective first and last frame contours. Claims 1 and 11 are directed to a device and a computer readable storage medium corresponding to the apparatus of Claim 1. Non-limiting examples of Applicants' claimed invention are seen in Figures 4, 10, 11, 13 and 14.

As disclosed in Applicants' originally filed specification, by using both a) a first frame contour of a first subset of the object to be extracted within a first frame covered background area, and b) a last frame contour of a second subset of the object to be extracted within the last frame uncovered background area, improved performance is obtained as compared to methods where contour information from only one frame is used.[1]

Nagaya describes a device and method for inputting a movie, extracting/detecting a moving object, and outputting the processed result as the movie. In Nagaya, a frame image containing a moving object is acquired, an original background differential image and a future background differential image is created, and the moving object image is cut out of the frame image.[2] A background judgment means 700 judges whether each pixel on a digital image belongs to the background, the moving object or a change in the background structure. Background judgment means 700 transmits moving object period information 1001 to a motion analysis means 800 and a moving object extraction means 900. The moving object period information 1001 is a collection of the periods for each pixel in which the moving object is judged to exist. Background judgment means 700 also transmits background image information 1002, or an accumulation of pixels judged as the background, to an output means 600.[3] Motion analysis means 800 calculates moving direction/velocity information 1003 of the moving object from digital image data 1000 and the moving object period information 1001, and transmits this information to the output means 600.[4]

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[1] Specification, page 36, line 8 – page 38, line 19; Figures 21-29.
[2] Nagaya, paragraphs [0014]-[0018].
[3] Nagaya, paragraph [0058].
[4] Nagaya, paragraph [0059].

To extract a moving object, an original background image 1801, a future background image 1803 and a current frame image 1802 are acquired. An original background difference 1807, between the original background image 1801 and the current frame image 1802, and a future background difference 1808, between the future background image 1803 and the present frame 1802, are created.[5] These background differences are compared and the moving object is extracted. An example of this background extraction/foreground extraction process is shown in Figure 20 of <u>Nagaya</u>.

<u>Rui</u> describes a mode based multihypothesis tracker that tracks at least one object through a sequence of images. This tracker analyzes a sequence of image frames and determines at least one corresponding mode for an input image frame. After determining a mode having a highest probability of correctness, that mode is provided as a current target estimate and used as a sample for processing a next sequential image.[6] <u>Rui</u> describes that a basic premise of the mode based multihypothesis tracker is that, given a sample, it is desirable to find the best contour within the vicinity of that sample. Section 3.1.1 of <u>Rui</u> describes a method of active contour searching. Section 3.1.3 describes contour refinement and section 3.1.3.1 describes edge likelihood determination. Section 3.2 of <u>Rui</u> describes in detail the mode based multihypothesis tracking algorithm that is based upon the previously described contour manipulations. Section 4.0 provides a working example of the invention of <u>Rui</u>.

However, both <u>Nagaya</u> and <u>Rui</u> fail to disclose or suggest a) detecting a first frame containing a first frame covered background area and detecting a last frame containing a last frame uncovered background area; b) prompting a user to input a first frame contour of a first subset of the object to be extracted within the first frame covered background area and to input a last frame contour of a second subset of the object to be extracted within the last

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[5] <u>Nagaya</u>, paragraph [0122].
[6] <u>Rui</u>, column 3, lines 36-64, and column 11, lines 26-54/

frame uncovered background area, respectively; and c) extracting the object from a plurality of frames from the first frame to the last frame based on the respective first and last frame contours.

As none of the cited prior art, individually or in combination, disclose or suggest all the elements of independent Claims 1, 9 and 11, Applicants submit the inventions defined by Claims 1, 9 and 11, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.[7]

Accordingly, in view of the present amendment and in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

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[7] MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations.